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**A JOINT OPTIMIZATION OF OPERATIONAL COST AND PERFORMANCE INTERFERENCE IN CLOUD DATA CENTERS**

**Abstract:**

Virtual machine (VM) scheduling is an important technique for the efficient operation of the computing resources in a data center. Previous work has mainly focused on consolidating VMs to improve resource utilization and to optimize energy consumption. However, the interference between collocated VMs is usually ignored, which can result in much worse performance degradation of the applications running on the VMs due to the contention of the shared resources. Based on this observation, we aim at designing efficient VM assignment and scheduling strategies in which we consider optimizing both the operational cost of the data center and the performance degradation of the running applications. We then propose a general model that captures the tradeoff between the two contradictory objectives. We present offline and online solutions for this problem by exploiting the spatial and temporal information of performance interference of VM collocation, where VM scheduling is performed by jointly considering the combinations and the life-cycle overlap of the VMs. Evaluation results show that the proposed methods can generate efficient schedules for VMs, achieving low operational cost while significantly reducing the performance degradation of applications in cloud data centers.